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EXAMINER

KIM, HEE-YONG

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/533,456	Applicant(s) MASHITANI ET AL.	
	Examiner HEE-YONG KIM	Art Unit 4192	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☒ Claim(s) 2 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/2/06 9/22/08</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

Claim 1 is objected to because of the following informalities: the claim cites "most approximate to 1:1" which is indefinite. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 2 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically Claim 2 recites the limitation "aspect ratio 1:2 to 2:1" in line 7 of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-6, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Berkel (US Patent 6,064,424), hereafter referenced as Berkel.

Regarding claim 1, Berkel discloses Autostereoscopic Display Apparatus.

Specifically Berkel discloses *A stereoscopic image processing method for extracting a plurality of dots serving as a pixel unit from a plurality of viewpoint images by each viewpoint image, wherein data of a plurality of dots serving as a pixel unit (view 4, Fig 5B) is extracted from each viewpoint image, an aggregate of such the data is defined as a pixel group (Pixel group consist of 7-views in Fig 5A), and an arrangement of pixel units in said pixel group is set so that an aspect ratio of a displayed pitch of said pixel group on a screen of a stereoscopic image display is rendered most approximate to 1 : 1 (Improve aspect ratio close to 1:1 by spreading Pixel group not only horizontally but also vertically in 3 rows, horizontal pitch=672 um and vertical pitch=864, column 10, line 66 to column 11, line 31).*

Regarding claim 3, Berkel discloses everything as applied above (see claim 1). Berkel further discloses *wherein the data of a plurality of dots serving as a pixel unit, which is extracted from each viewpoint image, is supplied so as to be obliquely aligned on a screen of the stereoscopic image display (Fig 5A), but fails to disclose wherein the data of a plurality of dots serving as a pixel unit, which is extracted from each viewpoint image, is obliquely arranged on a bit map.* However the examiner maintains that two methods are equivalent and either can be translated into the other.

Regarding claim 4, Berkel discloses everything as applied above (see claim 1). Berkel further discloses *wherein the data of a plurality of dots serving as a pixel unit, which is extracted from each viewpoint image, is supplied so as to be obliquely aligned on a screen of the stereoscopic image display (Fig 5A).*

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Regarding claim 5, Claim 5 is equivalent to claim 4, because it would have been obvious one of ordinary skill in the art at the time invention was made to provide *wherein a video signal is created and supplied so that the data of a plurality of dots serving as a pixel unit, which is extracted from each viewpoint image, is obliquely aligned on a screen of the stereoscopic image display*, as a matter of rendering image according to the pixel layout based on the claim 4. Therefore claim 5 is inherent in the prior arts applied to claim 4. Regarding claim 6, Berkel discloses everything as applied above (see claims 1 and 2). In figure 5A, If k =number of subpixels (colors), M =number of horizontal pixels, N =number of vertical pixels, then there are $k \cdot M$ dots available horizontally and N dots vertically. Berkel discloses that a pixel group consists of L dots (views) horizontally and k dots (3 RGB rows) vertically in Fig 5A. Therefore, there are *horizontal kM/L x vertical N/k pixel groups*, which is same as *the number of pixels of each viewpoint image*.

Regarding claim 10, Berkel discloses everything as applied above (see claim 6). Berkel further discloses implicitly *wherein each viewpoint image is rendered large by adding by one to several dots on both sides, and the data extracted from said added dots is used in a non-data area to be occurred on both sides of a screen*. In figure 5A, even if all the pixels are labeled, because of the oblique nature of the pixel group, some of left most pixels do not belong to the first pixel group and therefore they are non-data. For example 7g in the second row, 6b in the third, 5r in the fourth, 4g and 6g in the fifth, 3b and 5b in the sixth are all non-data. However the view numbers and colors are

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assigned to them in consistent with the periodic pixel group pattern. Similarly the same token goes to the right side.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berkel in view of Hau (US patent 5,528,301), hereafter referenced as Hau

Regarding claim 7, Berkel discloses everything as applied above (see claim 6). However he fails to disclose *wherein the number of pixels of each viewpoint image is horizontal kM/L x vertical N/k , and an image obtained in an image obtaining system is processed so that an aspect ratio of an image is coincident with an aspect ratio of a displayed image and each viewpoint image is obtained*. However the examiner maintains that it was well known in the art to provide *wherein the number of pixels of each viewpoint image is horizontal kM/L x vertical N/k , and an image obtained in an image obtaining system is processed so that an aspect ratio of an image is coincident with an aspect ratio of a displayed image and each viewpoint image is obtained as taught by Hau*.

In the similar field of view Hau discloses Universal Video Format Size Converter. Specifically Hau discloses video resizing in the background of invention at the column 1,

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line 42-52 which enables that *an aspect ratio of an image is coincident with an aspect ratio of a displayed image and each viewpoint image is obtained.*

Therefore, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Berkel by providing *wherein the number of pixels of each viewpoint image is horizontal kM/L x vertical N/k , and an image obtained in an image obtaining system is processed so that an aspect ratio of an image is coincident with an aspect ratio of a displayed image and each viewpoint image is obtained*, as taught by Hau, for the purpose of adjusting input video size corresponding to output display.

Regarding claim 8, the claim 8 is equivalent to the claim 7. Because it would have been obvious to one of ordinary skill in the art at the time invention could provide *wherein an aspect ratio of an image obtaining system is rendered coincident with an aspect ratio of a displayed image and each viewpoint image is obtained*, as a matter of rendering image according to the pixel layout based on the claim 7. Therefore, the claim 8 is inherent in the prior art applied to the claim 7.

Regarding claim 9, Berkel discloses everything as applied above (see claim 1). However Berkel fails to disclose *wherein the number of displayed pixels is horizontal M x vertical N , the number of viewpoints is L , the number of dots constituting one pixel is k , the number of pixels of each viewpoint image is horizontal kM/L x vertical N/k , each obtained viewpoint is applied to a magnifying process so as to become horizontal M x vertical N , and data of necessary dots is extracted and generated from each viewpoint image by each corresponding image area in each viewpoint image*. However the

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examiner maintains that it was well known in the art to provide *wherein the number of displayed pixels is horizontal M x vertical N , the number of viewpoints is L , the number of dots constituting one pixel is k , the number of pixels of each viewpoint image is horizontal kM/L x vertical N/k , each obtained viewpoint is applied to a magnifying process so as to become horizontal M x vertical N , and data of necessary dots is extracted and generated from each viewpoint image by each corresponding image area in each viewpoint image*, as taught by Hau. As applied to claim 7, Hau discloses the method of resizing video and can be applied to not only decimation but also *magnifying process* too.

Therefore, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Berkel by specifically providing *wherein the number of displayed pixels is horizontal M x vertical N , the number of viewpoints is L , the number of dots constituting one pixel is k , the number of pixels of each viewpoint image is horizontal kM/L x vertical N/k , each obtained viewpoint is applied to a magnifying process so as to become horizontal M x vertical N , and data of necessary dots is extracted and generated from each viewpoint image by each corresponding image area in each viewpoint image*, as taught by Hau, for the purpose of adjusting input video size corresponding to output display.

Claims 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Berkel in view of Jones (US patent 6,573,928), hereafter referenced as Jones.

Regarding claim 11, Berkel discloses everything as applied above (see claim 6). However he fails to disclose *wherein black data is used in a non-data area to be*

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occurred on both sides of a screen. However the examiner maintains that it was well known in the art to provide *wherein black data is used in a non-data area to be occurred on both sides of a screen*, as taught by Jones.

In the similar field of view Jones discloses Display Controller, Three Dimensional Display, and Method of Reducing Crosstalk. Specifically Jones discloses initializing display buffer with *black* at the start of each new row in the case of one pixel delay in column 10, line 64 to column 11, line 20.

Therefore, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Berkel by specifically providing *wherein black data is used in a non-data area to be occurred on both sides of a screen* for the purpose of improving display, as taught by Jones, for the purpose of initializing the beginning or end of horizontal line.

Claims 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Berkel and Hau in view of Richards (US patent 5,386,245), hereafter referenced as Richards.

Regarding claim 12, Berkel and Hau discloses everything as applied above (see claims 6). However he fails to disclose *wherein in a non-data area to be occurred on both sides of a screen, copied data of the dots having the same viewpoint adjacent to the non-data area is used.* However the examiner maintains that it was well known in the art to provide *wherein in a non-data area to be occurred on both sides of a screen, copied data of the dots having the same viewpoint adjacent to the non-data area is used*, as taught by Richards.

In the similar field of view Richards discloses Apparatus and Method for Processing a Digital Video Signal Which Prevents Discontinuity and Erosion of the Picture Area. Specifically Richards discloses edge pixel repeating (*copying data adjacent to the non-data area*) at the both side of horizontal line of the screen in the Figure 5B and in column 4, line 29-35.

Therefore, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Berkel by specifically providing *wherein in a non-data area to be occurred on both sides of a screen, copied data of the dots having the same viewpoint adjacent to the non-data area is used*, as taught by Richards, for the purpose of extrapolation of pixels in non-data area.

Claims 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Berkel in view of Son (US patent 6,606,078), hereafter referenced as Son.

Regarding claim 13, Berkel discloses everything as applied above (see claims 1). However he fails to disclose *wherein a stereoscopic vision-use image that also has a parallax in a vertical direction is generated*. However the examiner maintains that it was well known in the art to provide *wherein a stereoscopic vision-use image that also has a parallax in a vertical direction is generated*, as taught by Son.

In the similar field of view Son discloses Multi-View Image Display System. Specifically Jones discloses a *vertical parallax* in Figure 10A and column 12, line 56 to column 13, line 12.

Therefore, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Berkel by specifically providing *wherein a*

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stereoscopic vision-use image that also has a parallax in a vertical direction is generated, as taught by Son, for the purpose of generating the vertical parallax.

Claims 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berkel in view of Hughes ("Producing HD Graphics", www.highdef.org/library/HDGraphics.htm, 1/31/2001), hereafter referenced as Hughes.

Regarding claim 14, Berkel discloses everything as applied above (see claim 1). However he fails to disclose *wherein an aspect ratio of a screen dot pitch is set so that an aspect ratio of a pitch of a displayed pixel group on the screen is rendered 1 : 1 to approximately 1:1*. However the examiner maintains that it was well known in the art to provide *wherein an aspect ratio of a screen dot pitch is set so that an aspect ratio of a pitch of a displayed pixel group on the screen is rendered 1 : 1 to approximately 1:1*, as taught by Hughes.

In the similar field of view Hughes specifically discloses that HDTV(High Definition TV) is composed of square pixel (*1:1 pixel aspect ratio*) and because of that it works well with PC based platform with advantage of WYSIWYG (What You See Is What You Get). Therefore there is motivation to *set a dot pitch so that an aspect ratio of a pitch of a displayed pixel group on the screen is rendered 1 : 1*.

Therefore, it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Berkel by specifically providing *wherein an aspect ratio of a screen dot pitch is set so that an aspect ratio of a pitch of a displayed pixel group on the screen is rendered 1 : 1 to approximately 1:1*, as taught by Hughes, for the purpose of interoperability across the displays

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Regarding claim 15, Berkel discloses everything as applied above (see claim 14). However he fails to disclose *a stereoscopic image display according to claim 14, configured such that if the number of viewpoints is L, and the number of dots constituting one pixel is k, a pitch of displayed dots is set to k (horizontal):L (vertical), and an aspect ratio of a displayed pixel group is rendered horizontal:vertical equal (=) to 1:1*. However the examiner maintains that it was well known in the art to provide a *stereoscopic image display according to claim 14, configured such that if the number of viewpoints is L, and the number of dots constituting one pixel is k, a pitch of displayed dots is set to k (horizontal):L (vertical), and an aspect ratio of a displayed pixel group is rendered horizontal:vertical equal (=) to 1, as taught by Hughes*.

As applied to the claim 14, Hughes discloses that there is a motivation to make the pixel aspect ratio as 1:1 (square pixel) as possible. One way to do is that a pixel group consists of L dots horizontally and k rows vertically and the dot pitch is set as k (horizontal):L (vertical). Then *the aspect ratio* will be $k \cdot L : L \cdot k = 1:1$.

Therefore it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Berkel by specifically providing *wherein an aspect ratio of a screen dot pitch is set so that an aspect ratio of a pitch of a displayed pixel group on the screen is rendered 1 : 1 to approximately 1:1*, as taught by Hughes, for the purpose of interoperability across the displays.

Regarding claim 16, Berkel discloses *A stereoscopic image display provided with a screen on which an image is displayed, and a separating means for separating a position capable of observing dots of each viewpoint image* (Fig 5A with 7 views).

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However he fails to disclose *a stereoscopic image display configured such that a pitch of displayed dots is k , the number of viewpoints is L , an aspect ratio of a screen dot pitch is set to $kL:1$ to approximately $kL:1$, an image in which dot data of each viewpoint image is set in sequence in a horizontal direction is supplied so as to display an image, and an aspect ratio of a pitch of a displayed pixel group on a screen is rendered $1:1$ to approximately $1:1$* . However the examiner maintains that it was well known in the art to provide *a stereoscopic image display configured such that a pitch of displayed dots is k , the number of viewpoints is L , an aspect ratio of a screen dot pitch is set to $kL:1$ to approximately $kL:1$, an image in which dot data of each viewpoint image is set in sequence in a horizontal direction is supplied so as to display an image, and an aspect ratio of a pitch of a displayed pixel group on a screen is rendered $1:1$ to approximately $1:1$, as taught by Hughes*.

As applied to the claim 14, Hughes discloses that there is a motivation to make the pixel aspect ratio as $1:1$ as possible. One way to do is that a pixel group consists of 1 row vertically and $k*L$ dots horizontally, and the dot pitch is set as $k*L(\text{vertical}):1(\text{horizontal})$. Then the aspect ratio will be $k*L:k*L=1:1$.

Therefore it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Berkel by specifically providing *a stereoscopic image display configured such that a pitch of displayed dots is k , the number of viewpoints is L , an aspect ratio of a screen dot pitch is set to $kL:1$ to approximately $kL:1$, an image in which dot data of each viewpoint image is set in sequence in a horizontal direction is supplied so as to display an image, and an aspect ratio of a pitch of a displayed pixel*

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group on a screen is rendered 1 : 1 to approximately 1:1, as taught by Hughes, for the purpose of interoperability across the displays.

Regarding claim 17, Berkel and Hughes discloses everything as applied above (see claims 1,2,16). Berkel further discloses *wherein a red color-use dot row, a green color-use dot row, and a blue color-use dot row are arranged in sequence in a vertical direction* (R, G, B rows at Fig5A).

Regarding claim 18, Berkel and Hughes disclose everything as applied above (see claim 16). Berkel further discloses the merit (relaxation of the alignment accuracy) of arranging the same color dots of different views contiguously in fig 6A and column 12, line 24-34.

Therefore it would have been obvious to one of ordinary skill in the art at the time invention was made to modify Berkel and Hughes by specifically providing *wherein the same color dots of which number corresponds to the number of viewpoint images are arranged successively*, as taught by Berkel, for the purpose of relaxation of the alignment accuracy.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HEE-YONG KIM whose telephone number is (571)270-3669. The examiner can normally be reached on Monday-Thursday,8:00am-5pm EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jeff Harold can be reached on 571-272-7519. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HEE-YONG KIM/
Examiner, Art Unit 4192

H.K
/Jefferey F Harold/
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